REMARKS

In the Office Action mailed July 17, 2008 the Office noted that claims 1-16 were pending and rejected claims 1-16. Claims 1-16 have been canceled, claims 17-38 are new, and thus, in view of the foregoing claims 17-38 remain pending for reconsideration which is requested. No new matter has been added. The Office's rejections are traversed below.

REJECTIONS under 35 U.S.C. § 103

Claims 1-16 stand rejected under 35 U.S.C. § 103(a) as being obvious over Honda, EP 0299415, in view of Tsukimoto EP 0538791. The Applicants respectfully disagree and traverse the rejection with an argument and amendment.

The Applicant has cancelled claims 1-16 in favor of claims 17-38. Support for the claims may be found, for example, in claims 1-16 as originally filed or previously presented and Figures 1-4 of the Application. The Applicants submit that no new matter is believed to have been added.

The invention lies in the field of the motors pertaining to the mode rotation type. In such motors, a progressive wave runs along the annular extent of an end face of the stator around the centerline of the stator. The top of the wave is in adherent contact with the rotor thereby to drive the rotor into rotation.

The progressive wave is created by a combination of two

bending oscillations (vibrations) of the stator which are at the same time in two different directions and temporally phase-shifted from each other.

Electro-active elements, typically piezoelectric, are inserted in the stator for causing the two vibration modes to appear.

In view of the necessary temporal phase shift, typical prior art uses a two-phase electric excitation with a corresponding phase shift between them.

By contrast, the invention exploits the temporal phase shift that appears between the vibration and the excitation. By using a stator in which the two modes have mutually different resonance frequencies, different phase shifts appear between a given excitation frequency on the one hand, and each vibration mode on the other, whereby the two vibration modes have a temporal phase shift between them if the excitation is the same for both modes, i.e. if the excitation is single-phased.

A convenient excitation frequency is one generating between both modes a phase-shift which corresponds to the angle between both directions of bending.

More preferably, the angle is 90° and, accordingly, the excitation frequency is selected to generate a temporal phase shift of 90°, as well.

It is especially convenient when the correct phase shift is obtained for an excitation frequency which is half the

sum of both resonance frequencies, so that the mechanical energy transmitted to both modes of vibration is substantially equal.

This is illustrated in Figure 5 of the application, showing the recommended excitation frequency Fu at the average between the two resonance frequencies F2 and F1, while the lower graph in figure 5 shows the phase shift of 90° obtained between the two modes when the excitation frequency is Fu.

In the embodiment of FIG 1-4, there are two electro active components, oriented differently from each other so that each of them excites one of the bending modes.

In the embodiment of FIG 6 and 7, each electro-active component 12, 13 is oriented at an angle (45°) intermediate between the two bending directions (0 and 90°) thereby to stimulate both bending modes.

In contrast, Honda discusses several embodiments. The reference does neither disclose two bending modes having two different resonance frequencies, nor does it disclose exciting the structure with a single phase at a frequency for which both bending modes would exhibit a temporal phase shift between them.

For example, in col. 4, l. 36-40, it appears that the excitation frequency is substantially equal to a resonance frequency. In other words there is only one resonance frequency. Furthermore, the vibration is in the thickness direction and the twist direction (See Honda col. 4, lines 28-35). The claims distinguish thereover in that the vibration of the invention is

in two bending directions and with two different resonance frequencies. Accordingly, a further difference is that according to the invention, the excitation frequency is different from at least one of the resonance frequencies.

In all the embodiments of Honda described thereafter in the reference (Fig. 5-21), the stator is symmetrical around the centerline, whereby it is not suggested that two different resonance frequencies could arise in two different bending directions. The text of the document does not disclose two different resonance frequencies in two different bending directions.

In the Office Action, it is asserted that a dissymmetry of the metal blocks (corresponding to the counterweights of the embodiments of the invention) is disclosed by Honda col. 7 lines 10-11. The whole sentence reads: "In the above embodiment, though the metal blocks are same as each other, the metal blocks may be asymmetric ***each other.***" (Emphasis added).

Thus, what is described is that the blocks could be different **from each other**, not that one of the metal blocks could be asymmetrical **in itself.**

Since the whole document suggests that the metal blocks should be symmetrical around the centerline, one of ordinary skill in the art reading the above sentence would provide blocks which are **asymmetrical to each other**, i.e. with respect to a radial plane, but which remain **symmetrical in themselves**, i.e.

around the centerline.

It is respectfully submitted that it is not reasonably possible to contend that this sentence of the reference could disclose or even suggest the two resonance frequencies of the invention, not to speak of the excitation frequency which is then selected to cause a phase shift between both bending modes having different resonance frequencies.

Further, the Office asserts that the invention would be rendered obvious by Honda in view of Tsukimoto because the latter discloses the stator designed to bend.

Admittedly, Tsukimoto discloses two bending modes with two different bending frequencies. (See Tsukimoto col. 4, line 54 to col. 5, line 39)

However, contrary to the claims, Tsukimoto needs two excitations and carefully manages to use each excitation for exciting only a respective one of the bending modes. (See Tsukimoto col. 6, lines 2-7) By contrast according to the claims, a single-phase excitation excites the two bending modes at such a frequency that the two modes have a phase shift between them. This is even a key-idea of this invention and Tsukimoto diverts there-from.

More specifically, according to Tsukimoto col. 7, lines 9-12, teaches to use two excitation phases which have a modified phase shift between them thereby to pre-compensate the different phase response of both modes to their respective excitation. In

other words, the different phase response is felt as a drawback in the prior art, whereas it is the key-phenomenon which is exploited in the invention.

As a consequence, none of the cited documents teaches to cause two phase-shifted bending modes to appear by means of a single excitation at a frequency for which the desired phase shift appears. Tsukimoto even diverts from this and thus could not help the one skilled in the art in modifying Honda.

Furthermore, and more generally, the examiner fails to show why the one skilled in the art would have modified Honda in a specific manner in view of Tsukimoto to obtain the invention. Honda shows a single phase excitation using twisting mode. Tsukimoto shows that two phases are necessary when using bending modes. The one wanting to make a single phase motor would not expect Tsukimoto to bring any help because the latter increases the number of necessary phases.

For at least the reasons discussed above, Honda and Tsukimoto, taken separately or in combination, fail to render obvious the features of claims 17 and 35 and the claims dependent therefrom.

Withdrawal of the rejection is respectfully requested.

SUMMARY

It is submitted that the claims satisfy the requirements of 35 U.S.C. § 103. It is also submitted that claims 17-38 be allowable. It is further submitted that the claims are not taught, disclosed or suggested by the prior art. The claims are therefore in a condition suitable for allowance. An early Notice of Allowance is requested.

The Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 25-0120 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17.

Respectfully submitted,

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